

8.1 Cleaning

It is recommended that the H1-20 be cleaned periodically to ensure long service life.

- Printer case and cover: Apply neutral detergent to the printer case and cover, and wipe them with a soft cloth. Do not use alcohol, thinner, or other solvents. Using of such solvents will cause the color of the printed case or cover and cause distortion on the printed case or cover. The printer with a hard cloth will damage the surface of the printer case or cover. Do not expose electronic parts or printer mechanism to moisture.
- Pen caps: The pen caps can be cleaned using a piece of paper or cotton wool saturated with alcohol.
- Platen: The platen may also be cleaned in the same way if necessary.
- Inside the printer: Eliminate any dust or foreign materials on the printer mechanism and contact point with a soft brush. Be sure not to damage the electronic parts or any part of circuit.

8.2 Troubleshooting

Should any problem occur, contact your EPSON dealer as soon as possible.

Appendix A SPECIFICATIONS

I. General

Model: H1-20
Maximum Character Size: 12mm
Maximum Resolution: 240 dots/mm
Pen: Retractable
Number of pens: 1
Pen type: Ballpoint

Paper size: A4

Paper type: Any

Pen movement precision: ±0.1mm

Pen change precision: ±0.1mm

II. Functions

Drawing mode: Self

Comments: 42 types for ploter mode, 18 types for printer mode, 18 types for printer mode

Character type: ASCII characters, 128 types

Functions: International characters, 128 types, for 12 characters, Automatic power-on/off, automatic power-off, automatic power-on

III. Power Supply

Voltage: For use in U.S.A. 100V ~ 120V AC, For use in Europe 230V ~ 240V AC

Frequency: 50/60 Hz

Power consumption: 10 VA max

APPENDICES

Self mode: 42 types for ploter mode, 18 types for printer mode, 18 types for printer mode
Printer mode: 42 types for ploter mode, 18 types for printer mode, 18 types for printer mode
Drawing mode: 42 types for ploter mode, 18 types for printer mode, 18 types for printer mode
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For use in U.S.A. 100V ~ 120V AC, For use in Europe 230V ~ 240V AC
50/60 Hz
10 VA max

Appendix A SPECIFICATIONS

I. General

Effective drawing size	: 267 mm (X-axis) × 192 mm (Y-axis)
Maximum drawing speed	: 230 mm/sec (along the pen axis)
Maximum resolution	: 0.1 mm
Pen response speed	: 15 times/sec
Number of pens	: 4 (changed automatically)
Pen types	: Fiber pens (10 colors, aqueous ink) Fiber pens (10 colors, oil-based ink) – option Ball-point pens (10 colors, aqueous ink) – option
Paper sizes	: ISO A4 (297 mm × 210 mm) B5 (257 mm × 182 mm) US letter size (279 mm × 216 mm)
Paper types	: Ordinary paper OHP film
Pen movement precision	: Better than 0.3 mm for a single pen Better than 0.5 mm for different pens
Pen change precision	: Within 0.3 mm

II. Functions

Drawing modes	: Self test mode Plotter mode Printer mode
Commands	: 42 types for plotter mode 0 18 types for plotter mode 1 38 types for printer mode
Character types	: ASCII characters (96 types) International characters (32 types ... for 11 countries)
Miscellaneous	: Automatic pen-up function (2 seconds during online operation)

III. Power Supply

Voltage	: For use in U.S.A. 117 ± 10% AC, For use in Europe 220/240 ± 10% AC
Frequency	: 49.5 to 60.5 Hz
Power consumption	: 30 VA max.

IV. Environmental Conditions

Temperature

- : 5 to 35°C (during operation)
- 30 to 70°C (during storage)
- 10 to 80% (during operation, with no condensation)
- 5 to 85% (during storage, with no condensation)

V. Reliability

MTBF

- : 1000 hours (at a duty ratio of 50%)
- Approx. 200 m (Aqueous fiber pen)

Pen lifetime

- : Approx. 400 m (Oil-based fiber pen)
- Approx. 400 m (Aqueous ball-point pen)

VI. Dimensions and weight

Dimensions

- : 415 (W) × 272 (D) × 81 (H) mm

Weight

- : 4.5 Kg

Appendix B OPTIONS AND CONSUMABLES

- Pen cartridge (with cartridge cap)
- Pens

Types : Aqueous ink fiber pens
Oil-based ink fiber pens
Aqueous ink ball-point pens

Colors : Black, red, green, blue, yellow, cyan, magenta, brown, purple, orange

- RAM (8K)
- Printer extension ROM
- HP (Hewlett Packard) GL emulation ROM

Function	Pin	Signal	Notes
STROBE	19	Active Low	This signal is the strobe pulse used to read data. The pulse width must be more than 0.5 μs at the receiving end. Normally, the signal is held to "HIGH"; data is read by the printer after this signal drops to "LOW".
DATA 1	20	DATA 1	Each signal indicates the state of a single bit. The "HIGH" state indicates "1" and "LOW" state indicates "0".
DATA 2	21	DATA 2	
DATA 3	22	DATA 3	
DATA 4	23	DATA 4	
DATA 5	24	DATA 5	
DATA 6	25	DATA 6	
DATA 7	26	DATA 7	
DATA 8	27	DATA 8	
Printer	28	Printer	Indicates that the printer has received data and is ready to accept the next data.

Appendix C INTERFACE

C.1 Standard Interface

1. Specifications

Data transmission mode : 8 bit parallel
 Synchronization : Controlled by STROBE pulses.
 Handshaking : Controlled by ACKNLG and BUSY signals.
 Logic level : TTL level compatible for input data and all interface control signals.

2. Interface Connector

Plug : 57-30360

3. Signal Assingment for Input Connector Terminal

	Pin No.	Return line pin No.	Signal name	Sender	Function
(Parallel interface) Use a twisted pair for each signal, and be sure to connect each return line to signal ground.	1	19	<u>STROBE</u>	Host Computer	This signal is the strobe pulse used to read data. The pulse width must be more than $0.5\mu s$ at the receiving end. Normally, this signal is held to "HIGH"; data is read by the printer after this signal drops to "LOW".
	2	20	DATA 1	Host Computer	Each signal indicates the state of a single bit. The "HIGH" state indicates "1" and "LOW" condition indicates "0".
	3	21	DATA 2	Host Computer	
	4	22	DATA 3	Host Computer	
	5	23	DATA 4	Host Computer	
	6	24	DATA 5	Host Computer	
	7	25	DATA 6	Host Computer	
	8	26	DATA 7	Host Computer	
	9	27	DATA 8	Host Computer	
	10	28	<u>ACKNLG</u>	Plotter	The "LOW" state indicates that the printer has received data and is ready to accept the next data.

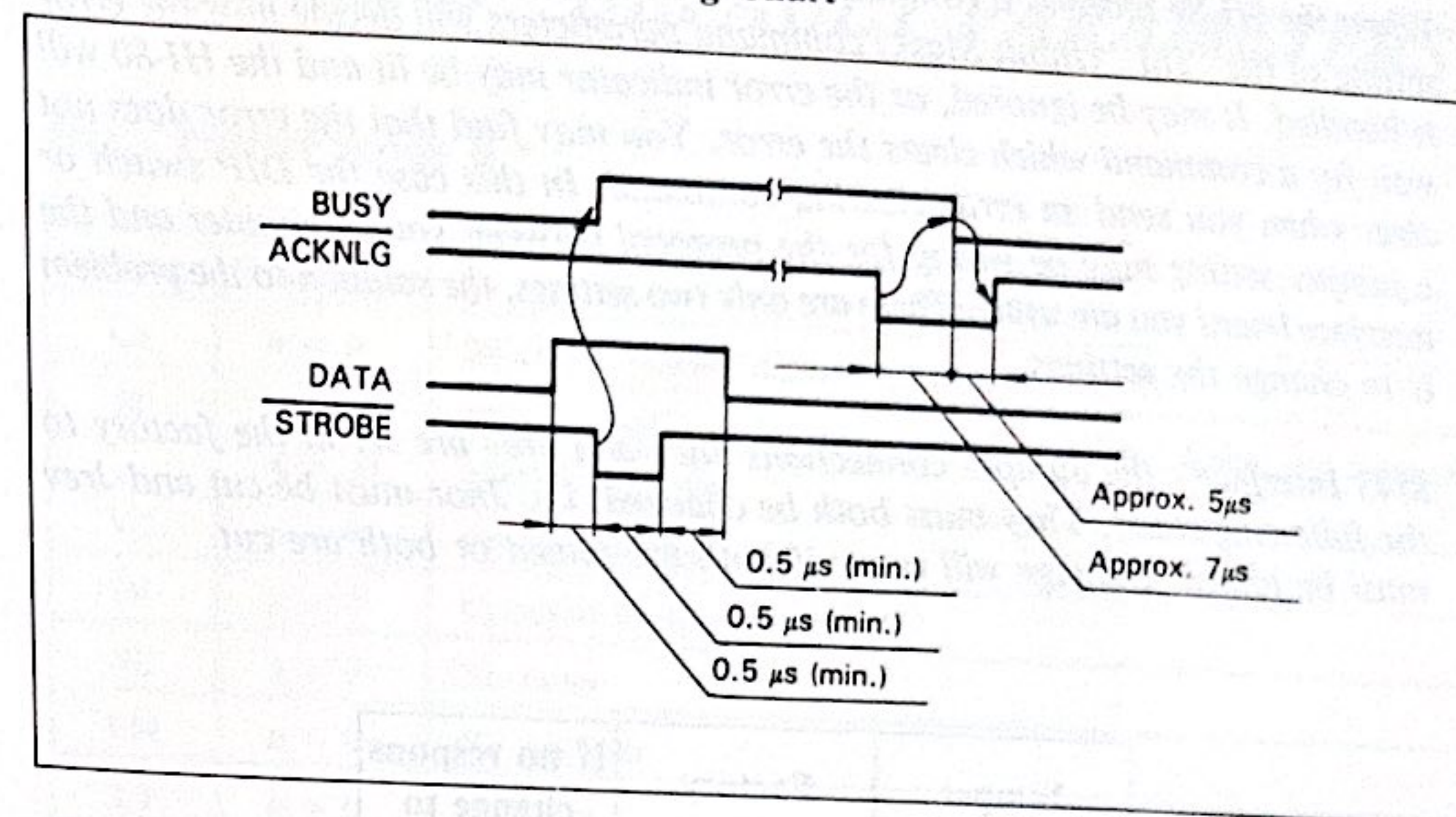
	Pin No.	Return line pin No.	Signal name	Sender	Function
Note) A horizontal bar over a signal name indicates that it is active ("1") when "LOW".	11	29	<u>BUSY</u>	Plotter	The "HIGH" state indicates that the printer is not ready to receive data; the "LOW" state indicates that it is ready to accept data. This signal goes "HIGH" under the following conditions: (1) During data entry (2) During printing (3) While the printer is OFFLINE (4) When a printer error occurs
	12	30	PE	Plotter	The "HIGH" state indicates that the printer is out of paper.
	13	—	SLCT	Plotter	The "HIGH" state indicates that the printer is selected.
	14	—	<u>AUTO FEED XT</u>	Host Computer	The "LOW" state causes the printer to feed a single line upon completion of printout.
	15	—	NC		Not used.
	16	—	0V	Plotter	Logic ground level (0V)
	17	—	CHASSIS GND	Plotter	Printer chassis GND level
	18	—	NC		Not used.
	19 } 30	— }	GND GND	(GND level)	Twisted pair return lines

	Pin No.	Return line pin No.	Signal name	Sender	Function
	31	—	INIT	Host Computer	The "LOW" state of this signal initializes the printer controller and clears the printer controller and clears the print buffer. The pulse width must be at least 50 μ s at the receiving end.
	32	—	ERROR	Plotter	The "LOW" state indicates that the printer is in one of the following conditions. (1) Offline (2) In an error condition
	33	—	GND	—	Same as pins 19 to 30.
	34	—	NC	—	Not used.
	35	—	+5V	Plotter	Pulled up to +5V through 3.3K-ohm resistor.
	36	—	SLCT IN	Host Computer	The "LOW" state indicates that the printer is selected.

NOTES:

1. "Return line" refers to the twisted pair return line, which must be connected to signal ground. Be sure to use a twisted pair for each interface signal and to connect each return line to the connector. Further, shielding the cable and connecting the GND lines to chassis ground at both the host computer and the printer will reduce signal line noise.
2. All interface unit operations are at the TTL level. Rise time and fall time of each signal should not exceed 0.2 μ s.
3. Data transmission cannot be performed independently of the ACKNLG and BUSY signals. (Data transmission to the printer is not possible until after the ACKNLG signal has become active and the BUSY signal has dropped to "LOW".)

4. Standard Parallel Interface Timing Chart



C.2 Optional interfaces

The following interfaces can be used with the HI-80.

- | | |
|---|----------------------|
| 1) TRS model I interface | (CAT #8120) |
| 2) Apple II parallel interface | (CAT #8131) |
| 3) New serial interface (Note 1) | (CAT #8143) |
| 4) RS-232C/current loop type 2 interface | (CAT #8145) |
| 5) Intelligent serial interface | (CAT #8148) |
| 6) IEEE 488 interface | (CAT #8161) |
| 7) Intelligent IEEE 488 interface | (CAT #8165) |
| 8) Parallel interface w/2K buffer | (CAT #8171) |
| 9) Serial interface s/32K buffer | (CAT #8149) |
| 10) Parall | (CAT #8172) |
| 11) Apple II intelligent parallel interface | (CAT #8132 or 8132W) |

Notes:

DIP SWITCH AND JUMPER SETTINGS FOR INTERFACES

1. The DIP switch settings are the same as those for the RX-80.
2. Transmission rate settings.
Full details of the settings are given in the interface manual. If your dealer has fitted the interface and has not given you the manual, then ask him for it.

3. When the HI-80 receives a command which causes an error in plotter mode, the setting of the "IM" (Input Mask) command parameters will decide how the error is handled. It may be ignored, or the error indicator may be lit and the HI-80 will wait for a command which clears the error. You may find that the error does not clear when you send an error clearing command. In this case the DIP switch or a jumper setting may be wrong for the protocol between your computer and the interface board you are using. There are only two settings, the solution to the problem is to change the settings.

8143 Interface - the Jumper connections Jnor and Jrev are set in the factory to the following states. They must both be changed, i.e. Jnor must be cut and Jrev must be joined. Damage will occur if both are joined or both are cut.

Jumper	Factory	If no respons change to
Jnor	joined	cut
Jrev	cut	joined.

8145 Interface - The switches SW2-2 and SW2-3 are set in the factory condition of ON and OFF respectively, they must both be changed as follows

SW	Factory	If no respons change to
2	ON	OFF
3	OFF	ON

8148 Interface - The switches SW 1-4 is the only one to be changed The factory condition is ON, if there is no response to the error condition, the switch should be set to off.

SW	Factory	If no respons change to
2	ON	OFF
3	OFF	ON

Appendix D DEFAULT PARAMETERS

D.1 Plotter mode 0

Command	Initial value	Remarks
CS	n = 0	Select the standard character code table. (Set 0)
SI	h = 24 w = 24	Character height is 2.4 mm, character width is 1.6 mm, and character interval is 2.4 mm.
VO	n = 0	On the base line
DI	n = 0	Character rotation angle is 0°.
SL	n = 0	No italics
EM	n = 0	No emphasis
LT	p = 0	Solid line
LP	l = 60	Line pitch is 6 mm.
IW	xmin = 0 xmax = 2510 ymin = 0 ymax = 1920	Set the effective drawing area to (251 mm × 192 mm). (The effective drawing area is set to US letter size when DIP switch 6 is ON.)
IF	p,q = 1	Set the drawing magnifying ratio to 1/1.
VS	n = 0	The pen velocity is set to 230 mm/sec when the pen is down.
TL	lp,ln = 10	The tick length is set to 1 mm in the positive and negative directions.
SP	n = 1	Select number 1 pen.
IM	e = 31 s = 1	Light Error LED for all errors and wait for input of an error release command.

D.2 Plotter mode 1

Command	Initial value	Remarks
S	n = 3	Character height is 2.8 mm, character width is 1.8 mm, and character interval is 2.8 mm.
Q	n = 0	Character rotation angle is 0°.
L	p = 0	Solid line
B	l = 30	Pitch is 6 mm.
T	n = 0	The pen velocity is 230 mm/sec when the pen is down.
J	n = 1	Select number 1 pen.

D.3 Printer mode

The parameters when the Power Supply is turned on with the CAPS/OFF switch held down or when switching to printer mode is carrying out using (18)_D from mode 0 and a "DF" command has been given are:

Starting print position	(24,0)
Print direction	+ Y (portrait)
Page length	267 mm (64 lines) — A4 251 mm (60 lines) — US 227 mm (54 lines) — B5
No. of print columns	80 columns (192 mm) — A4, US 68 columns (164 mm) — B5
Character size	Height: 2.4 mm Width: 1.6 mm Spacing: 2.4 mm
Pen	Pen No. 1
Line feed distance	4.2 mm (set automatically according to character height)

Appendix E SWITCHING MODES AND PARAMETER CHANGES

Most parameters are not changed when the HI-80 is switched between modes under software control. Thus it is possible to switch back and fore without changing the parameters. Some parameters can be changed in both modes. When changing from plotter to printer modes however, the format commands (tabulation/margin etc) are all reset and so on exiting printer mode all values are lost.

The following table summarises which parameters are changed when the mode is changed, and which of them can be changed in printer and plotter mode.

Command	Plotter to Printer	Printer to Plotter	Changeable in printer mode	Changeable in plotter mode
CS	Not changed	Not changed	Yes	Yes
SI	Not changed	Not changed	Yes	Yes
VO	n = 0	Not changed	Yes	Yes
DI	n = 0 or n = 900	Not changed	Yes	Yes
SL	Not changed	Not changed	Yes	Yes
EM	Not changed	Not changed	No	Yes
LT	Not changed	Not changed	No	Yes
LP	Not changed	Not changed	No	Yes
IW	Not changed	Not changed	No	Yes
IF	p,q = 1 (mag 1:1)	Not changed	Yes	Yes
VS	Not changed	Not changed	No	Yes
TL	Not changed	Not changed	Yes	Yes
SP	Not changed	Not changed	No	Yes
IM	Not changed	Not changed	No	Yes

Appendix F COMMANDS SUMMARY

F.1 PLOTTER MODE 0

Category	Command type	Command name	Command identification	Function
Drawing commands	Line	DA	Draw Absolute	Draws a line from the current pen position to specified absolute coordinates.
		DR	Draw Relative	Draws a line from the current pen position to specified relative coordinates.
	Pen movement	MA	Move Absolute	Raises the pen and moves it to specified absolute coordinates.
		MR	Move Relative	Raises the pen and moves it to specified relative coordinates.
	Character and symbol	LA	Label ASCII string	Draws an ASCII character
		*LU	Label Download character	Draws a download character.
	Circle	CA	Circle Absolute	Draws a circle or arc around a center specified with absolute coordinates.
		CR	Circle Relative	Draws a circle or arc starting at the current position.
	Curve	VA	Curve Absolute	Connects points specified with absolute coordinates in a smooth curve.
		VR	Curve Relative	Connects points specified with relative coordinates in a smooth curve.
	Graph	AX	Axis	Draws coordinate axes in the X and Y directions and plots scale marks.
		GR	Grid	Draws a lattice along the X and Y axes.
		HB	Hatching a Box	Draws a rectangle and hatches its interior.
		HP	Hatching a Pie segment	Draws a fan shape and colors it in.
		AM	Absolute line and Mark	Draws marks on points specified with absolute coordinates and connects them with a line.
		RM	Relative line and Mark	Draws marks on points specified with relative coordinates and connects them with a line.
	Arrow	AR	Arrow	Draws an arrow.

Category	Command type	Command name	Command identification	Function
Character and symbol format commands	Character and symbol format	CS	Character Set	Selects the character code table which is drawn with the LA command.
		SI	Character Size	Specifies the size of characters and symbols.
		DI	Character Direction	Specifies the rotational angle of characters and symbols.
		VO	Vertical Offset from character base line	Specifies the vertical offset from the character base line.
		SL	Character Slant	Specifies Italic characters.
		EM	Character Emphasis	Specifies enhanced characters.
		RC	Reset character	Initializes character and symbol specifications.
		*UC	Download character	Defines download characters
	Line format	LT	Line Type	Specifies the line type.
		LP	Line Pitch	Specifies the pitch of dotted lines, broken lines, and chained lines.
	Coordinate	IW	Input Window	Specifies the effective plotting range.
		OR	Origin	Specifies the current pen position as the origin.
		IF	Input Factor	Specifies the drawing magnification.
	Speed	VS	Select Velocity	Specifies the pen-down speed.
	Axis	TL	Tick Length	Specifies the length of the tick marks on axes drawn with the X command.
Miscellaneous	Pen movement	HO	Home Position	Raises the pen and moves it to the origin.
		CH	Change Paper Position	Raises the pen and moves it to the paper-change position.
	Pen change	SP	Select Pen	Selects pen colors and caps the four pens.
	Reset	CI	Clear Interface	Clear the interface and clears the input buffer.
		IN	Initialize Plotter	Initializes the plotter.
		DF	Default Values	Initializes all functions.
	Error processing	IM	Input Mask	Specifies error processing and masking error.
	Command change	AC	Alternate Command	Specifies the other command format.
	Mode change	DC2 (18) _D <12> _H	Device Control 2	Change to the printer mode.

F.2 PLOTTER MODE 1

Category	Command type	Command name	Command identification	Function
Drawing Commands	Line	D	Absolute Draw	Draws a line from the current pen position to specified absolute coordinates.
		I	Relative Draw	Draws a line from the current pen position to specified relative coordinates.
	Pen movement	M	Absolute Move	Raises the pen and moves it to specified absolute coordinates.
		R	Relative Move	Raises the pen and moves it to specified relative coordinates.
	Character and symbol	P	Print	Draws an ASCII or JIS character
		N	Mark	Draws marks on points specified with absolute coordinates.
	Graph	X	Axis	Draws coordinates axis in the X and Y directions.
Character and Symbol Format Commands	Character and symbol format	S	Alpha Scale	Specifies the size of characters and symbols.
		Q	Alpha Rotate	Specifies the rotational angle of characters and symbols.
		A	Alpha Reset	Initializes character and symbol specifications.
	Line format	L	Line Type	Specifies the line type.
		B	Line Scale	Specifies the pitch of dotted, broken and chained lines.
	Speed	T	Pen speed	Specifies the pen speed.
	Pen change	J	Select Pen	Selects pen colors and caps the four pens.
Miscellaneous	Pen movement	H	Home	Raises the pen and moves it to the origin.
		:	Clear	Clears all parameters.
	Initialize	;	Interface Clear	Clears interface and input buffer.
		AC	Alternate mode	Specifies the other command mode.

The printer mode cannot be entered from command mode 1.

“*” indicates that a command is valid when optional RAM is installed.

F.3 PRINTER MODE

Command	Function
BS	Back space
HT	Horizontal tabulation
LF	Line feed
VT	Vertical tabulation
FF	Form feed
CR	Carriage return
SO	Sets Enlarged print mode.
SI	Sets the condensed print mode.
DC2	Cancels the condensed print mode.
DC4	Cancels Enlarged print mode set by SO code.
ESC + SO	Same as SO.
ESC + SI	Same as SI.
ESC + % + n*	Selects the internal/user defined character set.
ESC + - + n	Sets/cancels the underlined print mode.
ESC + 0	Sets line spacing to 3.2 mm (about 1/8 inch).
ESC + 1	Sets line spacing to 2.8 mm (about 7/72 inch).
ESC + 2	Sets line spacing to 4.2 mm (about 1/6 inch).
ESC + 3 + n	Sets line spacing to approximately n/216 inch.
ESC + 4	Italic character set selection.
ESC + 5	Italic character set cancel.
ESC <	Sets one line unidirectional printing.
ESC + @	Initializes the printer.
ESC + A + n	Sets line spacing to approximately n/72 inch.
ESC + C + n	Sets the page length.
ESC + E	Sets the emphasized print mode.
ESC + F	Cancels the emphasized print mode.
ESC + G	Sets the double-strike print mode.
ESC + H	Cancels the double-strike print mode.
ESC + J + n	Feeds n/216 inch line spacing for one line.
ESC + M	Sets the pseudo-elite sized character.
ESC + N + n	Sets skip-over-perforation.
ESC + O	Cancels skip-over-perforation.
ESC + P	Sets the standard size character.
ESC + Q + n	Sets the right margin.
ESC + R + n	Selects the character set.

Command	Function
ESC + S + n	Sets the superscript/subscript mode.
ESC + T	Cancels the superscript/subscript mode.
ESC + W + n	Sets/cancels Enlarged print mode.
ESC + e + ($\frac{0}{1}$) + n	Sets horizontal/vertical tab unit.
ESC + f + ($\frac{0}{1}$) + n	Sets horizontal/vertical skip position.
ESC + l + n	Sets the left margin.
ESC + s + n	Sets/cancels half speed printing.
GS + C + n	Selects the pen.
GS + D + n	Sets the print direction.
GS + G	Shifts to the plotter mode.
GS + H + n1 + n2	Sets the character height.
GS + I + n1 + n2	Sets/cancels the italic character print mode.
GS + W + n1 + n2	Sets the character width.
DEL	Delete.

Appendix G COMMANDS PARAMETERS AFFECTED BY OTHER COMMANDS

• Command mode 0

Command	Commands Affected
CS	LA
SI	LA, AM, LU, AX, RM
VO	LA, LU
DI	LA, AM, LU, RM
SL	LA, LU
EM	LA, LU, AX
RC	LA, LU, AX, AM, RM
LT	DA, DR, CA, CR, VA, VR, GR, HB, HP, AM, RM
LP	DA, DR, CA, CR, VA, VR, GR, AM, RM, HB, HP
IF	DA, DR, MA, MR, LA, AM, LU, CA, CR, VA, VR, AX, GR, HB, HP, AR
OR	DA, MA, CA, VA, HP, AM
VS	DA, DR, LA, LU, CA, CR, VA, VR, AX, GR, HB, HP, AM, AR
TL	AX
SP	DA, DR, LA, LU, CA, CR, VA, VR, AX, GR, HB, HP, AM, RM, AR

• Command mode 1

Command	Commands Affected
S	P, N
Q	P, N
L	D, I
B	D, I
T	D, I, P, N, X
J	D, I, P, N, X

NOTE: If the mode is changed the parameters of the initial mode will define the settings for the subsequent mode.

Appendix H CHARACTER CODE TABLES

U.S.A

Hex. No.	Binary No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0000																
1	0001																
2	0010																
3	0011																
4	0100																
5	0101																
6	0110																
7	0111																
8	1000																
9	1001																
A	1010																
B	1011																
C	1100																
D	1101																
E	1110																
F	1111																

FRANCE

Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	SP	0	1	2	3	4	5	6	7	8	9	A	B	C	D
1	0001	DC1	1	2	3	4	5	6	7	8	9	A	B	C	D	E
2	0010	DC2	1	2	3	4	5	6	7	8	9	A	B	C	D	E
3	0011	DC3	1	2	3	4	5	6	7	8	9	A	B	C	D	E
4	0100	DC4	1	2	3	4	5	6	7	8	9	A	B	C	D	E
5	0101		1	2	3	4	5	6	7	8	9	A	B	C	D	E
6	0110		1	2	3	4	5	6	7	8	9	A	B	C	D	E
7	0111		1	2	3	4	5	6	7	8	9	A	B	C	D	E
8	1000	BS	1	2	3	4	5	6	7	8	9	A	B	C	D	E
9	1001		1	2	3	4	5	6	7	8	9	A	B	C	D	E
A	1010	LF	1	2	3	4	5	6	7	8	9	A	B	C	D	E
B	1011	ESC	1	2	3	4	5	6	7	8	9	A	B	C	D	E
C	1100	FF	1	2	3	4	5	6	7	8	9	A	B	C	D	E
D	1101	CR	1	2	3	4	5	6	7	8	9	A	B	C	D	E
E	1110	SO	1	2	3	4	5	6	7	8	9	A	B	C	D	E
F	1111	SI	1	2	3	4	5	6	7	8	9	A	B	C	D	E

GERMANY

Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	SP	0	1	2	3	4	5	6	7	8	9	A	B	C	D
1	0001	DC1	1	2	3	4	5	6	7	8	9	A	B	C	D	E
2	0010	DC2	1	2	3	4	5	6	7	8	9	A	B	C	D	E
3	0011	DC3	1	2	3	4	5	6	7	8	9	A	B	C	D	E
4	0100	DC4	1	2	3	4	5	6	7	8	9	A	B	C	D	E
5	0101		1	2	3	4	5	6	7	8	9	A	B	C	D	E
6	0110		1	2	3	4	5	6	7	8	9	A	B	C	D	E
7	0111		1	2	3	4	5	6	7	8	9	A	B	C	D	E
8	1000	BS	1	2	3	4	5	6	7	8	9	A	B	C	D	E
9	1001		1	2	3	4	5	6	7	8	9	A	B	C	D	E
A	1010	LF	1	2	3	4	5	6	7	8	9	A	B	C	D	E
B	1011	ESC	1	2	3	4	5	6	7	8	9	A	B	C	D	E
C	1100	FF	1	2	3	4	5	6	7	8	9	A	B	C	D	E
D	1101	CR	1	2	3	4	5	6	7	8	9	A	B	C	D	E
E	1110	SO	1	2	3	4	5	6	7	8	9	A	B	C	D	E
F	1111	SI	1	2	3	4	5	6	7	8	9	A	B	C	D	E

ENGLAND

Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	SP	0	1	2	3	4	5	6	7	8	9	A	B	C	D
1	0001	DC1	1	2	3	4	5	6	7	8	9	A	B	C	D	E
2	0010	DC2	1	2	3	4	5	6	7	8	9	A	B	C	D	E
3	0011	DC3	1	2	3	4	5	6	7	8	9	A	B	C	D	E
4	0100	DC4	1	2	3	4	5	6	7	8	9	A	B	C	D	E
5	0101		1	2	3	4	5	6	7	8	9	A	B	C	D	E
6	0110		1	2	3	4	5	6	7	8	9	A	B	C	D	E
7	0111		1	2	3	4	5	6	7	8	9	A	B	C	D	E
8	1000	BS	1	2	3	4	5	6	7	8	9	A	B	C	D	E
9	1001		1	2	3	4	5	6	7	8	9	A	B	C	D	E
A	1010	LF	1	2	3	4	5	6	7	8	9	A	B	C	D	E
B	1011		1	2	3	4	5	6	7	8	9	A	B	C	D	E
C	1100	FF	1	2	3	4	5	6	7	8	9	A	B	C	D	E
D	1101	CR	1	2	3	4	5	6	7	8	9	A	B	C	D	E
E	1110	SO	1	2	3	4	5	6	7	8	9	A	B	C	D	E
F	1111	SI	1	2	3	4	5	6	7	8	9	A	B	C	D	E

DENMARK

Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	SP	0	1	2	3	4	5	6	7	8	9	A	B	C	D
1	0001	DC1	1	2	3	4	5	6	7	8	9	A	B	C	D	E
2	0010	DC2	1	2	3	4	5	6	7	8	9	A	B	C	D	E
3	0011	DC3	1	2	3	4	5	6	7	8	9	A	B	C	D	E
4	0100	DC4	1	2	3	4	5	6	7	8	9	A	B	C	D	E
5	0101		1	2	3	4	5	6	7	8	9	A	B	C	D	E
6	0110		1	2	3	4	5	6	7	8	9	A	B	C	D	E
7	0111		1	2	3	4	5	6	7	8	9	A	B	C	D	E
8	1000	BS	1	2	3	4	5	6	7	8	9	A	B	C	D	E
9	1001		1	2	3	4	5	6	7	8	9	A	B	C	D	E
A	1010	LF	1	2	3	4	5	6	7	8	9	A	B	C	D	E
B	1011		1	2	3	4	5	6	7	8	9	A	B	C	D	E
C	1100	FF	1	2	3	4	5	6	7	8	9	A	B	C	D	E
D	1101	CR	1	2	3	4	5	6	7	8	9	A	B	C	D	E
E	1110	SO	1	2	3	4	5	6	7	8	9	A	B	C	D	E
F	1111	SI	1	2	3	4	5	6	7	8	9	A	B	C	D	E

SWEDEN

Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	SP	!	1	2	3	4	5	6	7	8	9	A	B	C	D
1	0001	DC1	!	1	2	3	4	5	6	7	8	9	A	B	C	D
2	0010	DC2	"	2	3	4	5	6	7	8	9	A	B	C	D	E
3	0011	DC3	#	3	4	5	6	7	8	9	A	B	C	D	E	F
4	0100	DC4	\$	4	5	6	7	8	9	A	B	C	D	E	F	G
5	0101		%	5	6	7	8	9	A	B	C	D	E	F	G	H
6	0110		&	6	7	8	9	A	B	C	D	E	F	G	H	I
7	0111		'	7	8	9	A	B	C	D	E	F	G	H	I	J
8	1000	BS	(	8	9	A	B	C	D	E	F	G	H	I	J	K
9	1001		)	9	A	B	C	D	E	F	G	H	I	J	K	L
A	1010	LF	*	:	;	<	=	>	? /							
B	1011	ESC	+	:	;	<	=	>	? /							
C	1100	FF	'	<	=	>	? /									
D	1101	CR	-	=	>	? /										
E	1110	SO	.	>	? /											
F	1111	SI	/	? /												

ITALY

Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Binary No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	SP	!	1	2	3	4	5	6	7	8	9	A	B	C	D
1	0001	DC1	!	1	2	3	4	5	6	7	8	9	A	B	C	D
2	0010	DC2	"	2	3	4	5	6	7	8	9	A	B	C	D	E
3	0011	DC3	#	3	4	5	6	7	8	9	A	B	C	D	E	F
4	0100	DC4	\$	4	5	6	7	8	9	A	B	C	D	E	F	G
5	0101		%	5	6	7	8	9	A	B	C	D	E	F	G	H
6	0110		&	6	7	8	9	A	B	C	D	E	F	G	H	I
7	0111		'	7	8	9	A	B	C	D	E	F	G	H	I	J
8	1000	BS	(	8	9	A	B	C	D	E	F	G	H	I	J	K
9	1001		)	9	A	B	C	D	E	F	G	H	I	J	K	L
A	1010	LF	*	:	;	<	=	>	? /							
B	1011	ESC	+	:	;	<	=	>	? /							
C	1100	FF	'	<	=	>	? /									
D	1101	CR	-	=	>	? /										
E	1110	SO	.	>	? /											
F	1111	SI	/	? /												

SPAIN

Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP
1	0001	DC1	1	1	A	Q	a	q	1	145	181	177	A	Q	a	q
2	0010	DC2	2	2	B	R	b	r	2	146	182	178	B	R	b	r
3	0011	DC3	3	3	C	S	c	s	3	147	183	179	C	S	c	s
4	0100	DC4	4	4	D	T	d	t	4	148	184	180	D	T	d	t
5	0101		5	5	E	U	e	u	5	149	185	181	E	U	e	u
6	0110		6	6	F	V	f	v	6	150	186	182	F	V	f	v
7	0111		7	7	G	W	g	w	7	151	187	183	G	W	g	w
8	1000	BS	8	8	H	X	h	x	BS	152	188	184	H	X	h	x
9	1001		9	9	I	Y	i	y		153	189	185	I	Y	i	y
A	1010	LF			J	Z	j	z	LF	154	190	186	J	Z	j	z
B	1011				K		k			155	191	187	K		k	
C	1100	FF			L		l		FF	156	192	188	L		l	
D	1101	CR	GS		M		m		CR	157	193	189	M		m	
E	1110	SO			N		n		SO	158	194	190	N		n	
F	1111	SI			O		o		SI	159	195	191	O		o	

JAPAN

Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	DC1	SP	0	@	P	'	p	DC1	144	160	0		P	'	p
1	0001	1	1	1	A	Q	a	q	1	145	161	1	A	Q	a	q
2	0010	DC2	2	2	B	R	b	r	DC2	146	162	2	B	R	b	r
3	0011	DC3	3	3	C	S	c	s	DC3	147	163	3	C	S	c	s
4	0100	DC4	4	4	D	T	d	t	DC4	148	164	4	D	T	d	t
5	0101		5	5	E	U	e	u		149	165	5	E	U	e	u
6	0110		6	6	F	V	f	v		150	166	6	F	V	f	v
7	0111		7	7	G	W	g	w		151	167	7	G	W	g	w
8	1000	BS	8	8	H	X	h	x	BS	152	168	8	H	X	h	x
9	1001		9	9	I	Y	i	y		153	169	9	I	Y	i	y
A	1010	LF			J	Z	j	z	LF	154	170		J	Z	j	z
B	1011				K		k			155	171		K		k	
C	1100	FF			L		l		FF	156	172		L		l	
D	1101	CR	GS		M		m		CR	157	173		M		m	
E	1110	SO			N		n		SO	158	174		N		n	
F	1111	SI			O		o		SI	159	175		O		o	

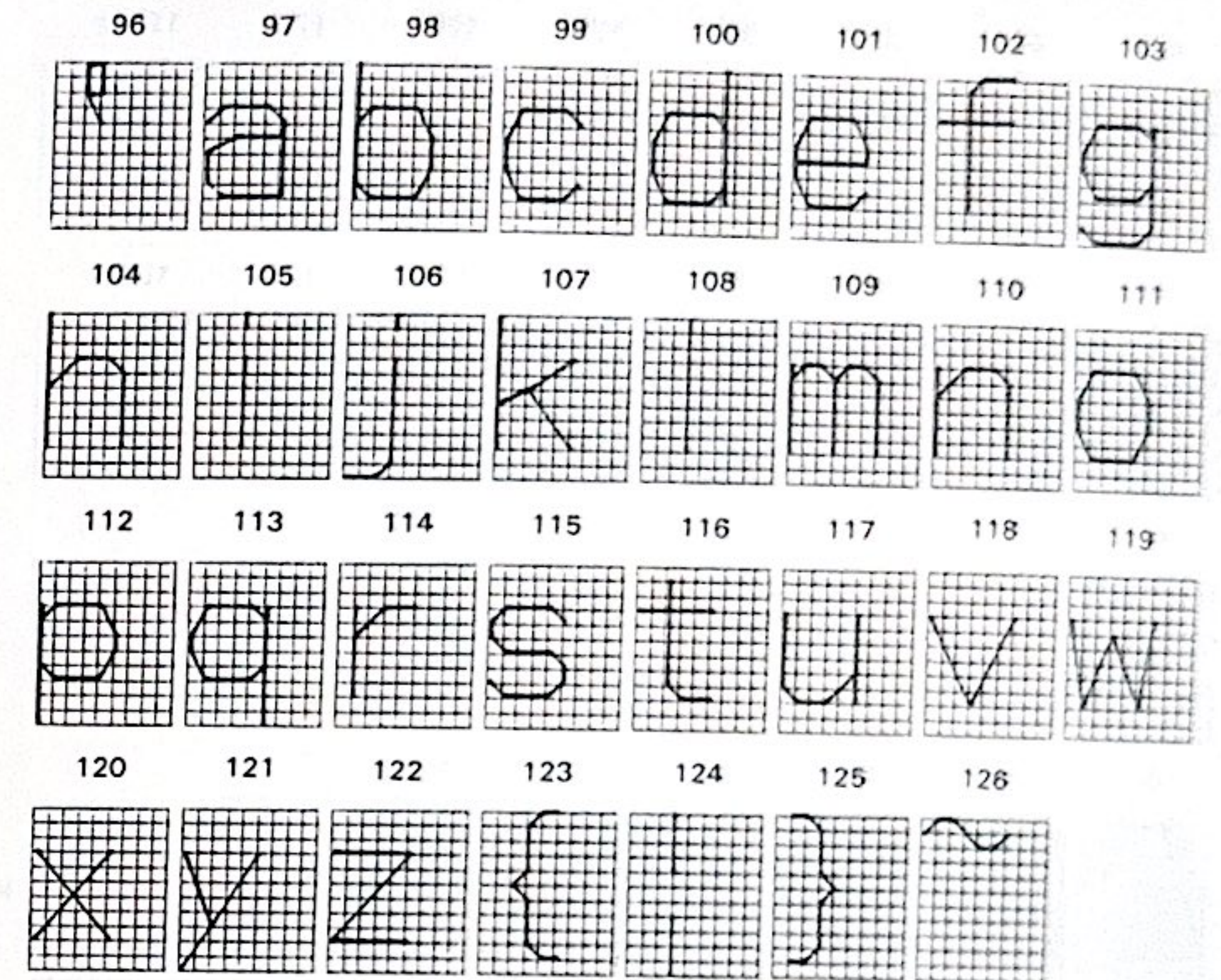
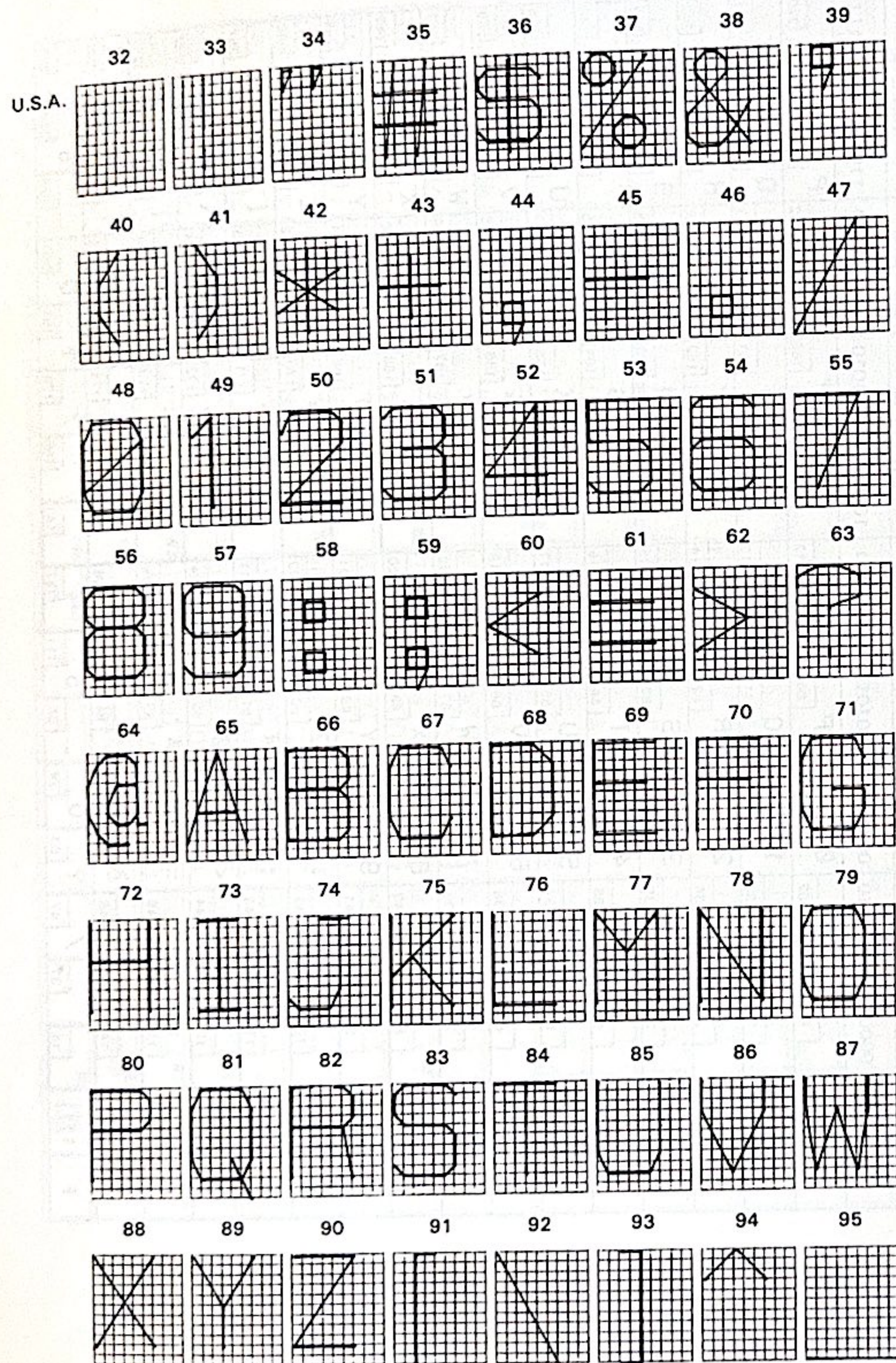
NORWAY

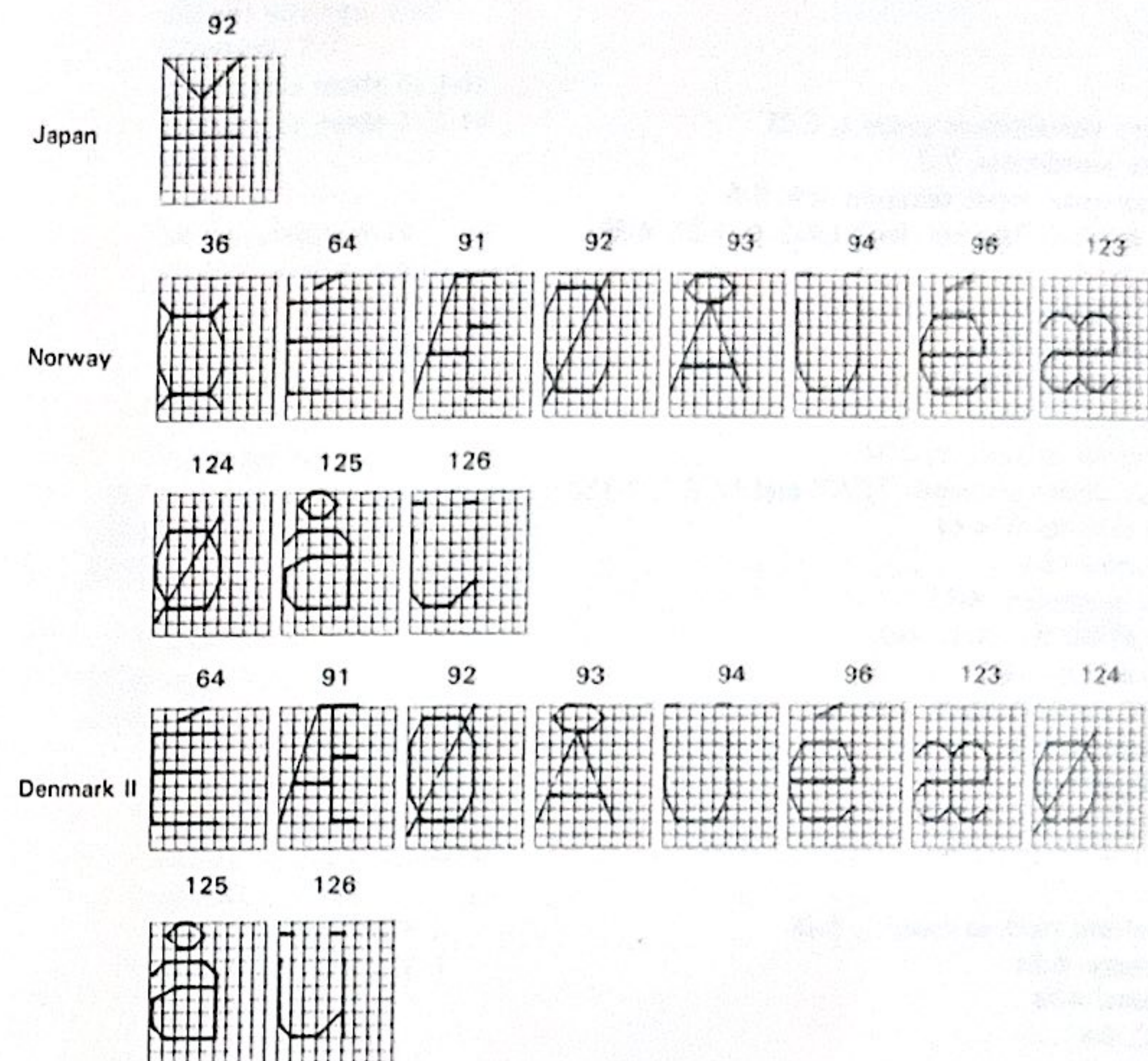
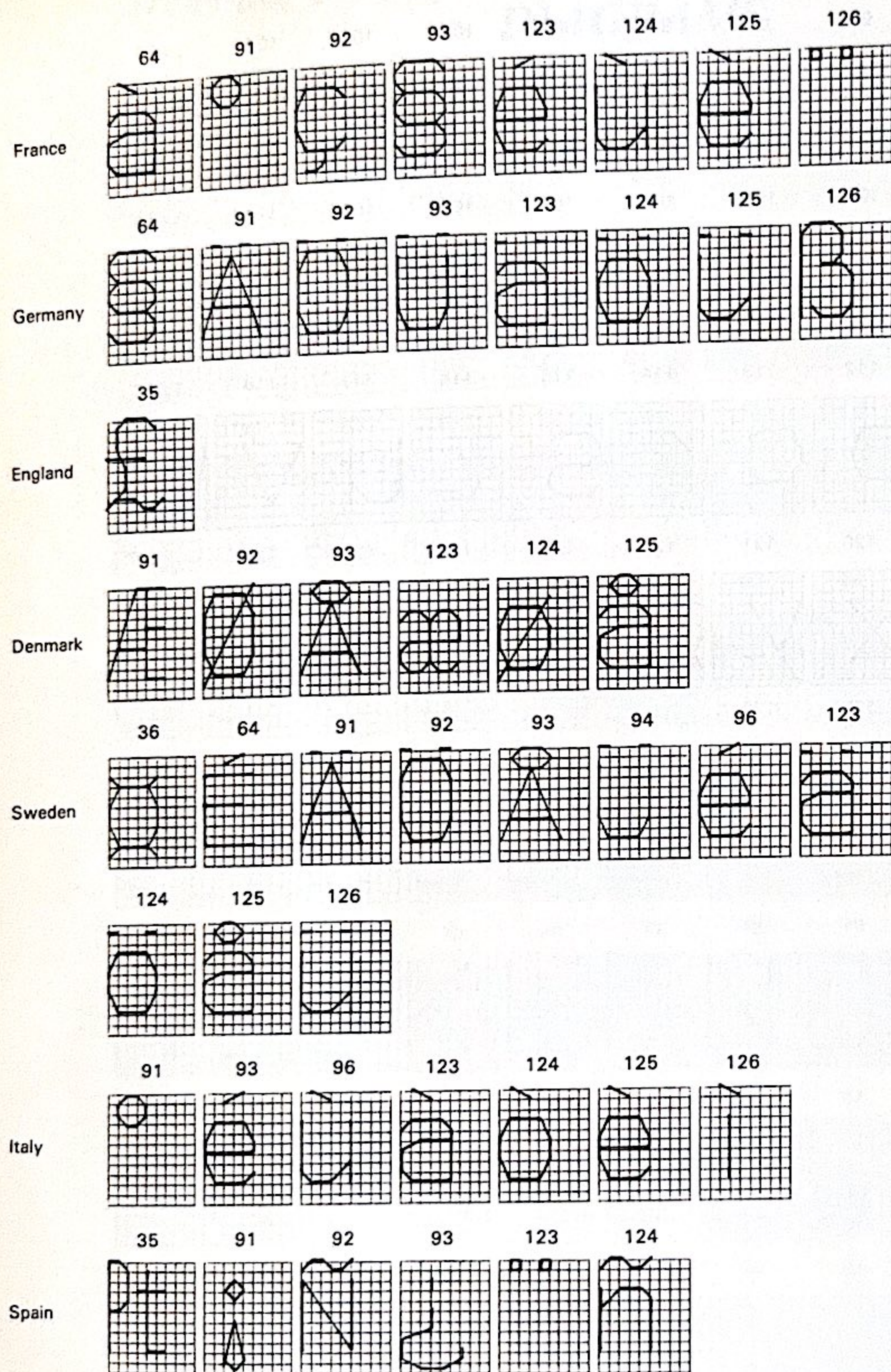
Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	SP	Ø	1	2	3	4	5	6	7	8	9	A	B	C	D
1	0001	DC1	1	2	3	4	5	6	7	8	9	A	B	C	D	E
2	0010	DC2	1	2	3	4	5	6	7	8	9	A	B	C	D	E
3	0011	DC3	1	2	3	4	5	6	7	8	9	A	B	C	D	E
4	0100	DC4	1	2	3	4	5	6	7	8	9	A	B	C	D	E
5	0101	5	21	22	23	24	25	26	27	28	29	30	31	32	33	34
6	0110	6	22	23	24	25	26	27	28	29	30	31	32	33	34	35
7	0111	7	23	24	25	26	27	28	29	30	31	32	33	34	35	36
8	1000	BS	8	24	25	26	27	28	29	30	31	32	33	34	35	36
9	1001	9	25	26	27	28	29	30	31	32	33	34	35	36	37	38
A	1010	LF	10	26	27	28	29	30	31	32	33	34	35	36	37	38
B	1011	ESC	11	27	28	29	30	31	32	33	34	35	36	37	38	39
C	1100	FF	12	28	29	30	31	32	33	34	35	36	37	38	39	40
D	1101	CR	13	29	30	31	32	33	34	35	36	37	38	39	40	41
E	1110	SO	14	30	31	32	33	34	35	36	37	38	39	40	41	42
F	1111	SI	15	31	32	33	34	35	36	37	38	39	40	41	42	43

DENMARK II

Hex. No.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex. No.	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	SP	Ø	1	2	3	4	5	6	7	8	9	A	B	C	D
1	0001	DC1	1	2	3	4	5	6	7	8	9	A	B	C	D	E
2	0010	DC2	1	2	3	4	5	6	7	8	9	A	B	C	D	E
3	0011	DC3	1	2	3	4	5	6	7	8	9	A	B	C	D	E
4	0100	DC4	1	2	3	4	5	6	7	8	9	A	B	C	D	E
5	0101	5	21	22	23	24	25	26	27	28	29	30	31	32	33	34
6	0110	6	22	23	24	25	26	27	28	29	30	31	32	33	34	35
7	0111	7	23	24	25	26	27	28	29	30	31	32	33	34	35	36
8	1000	BS	8	24	25	26	27	28	29	30	31	32	33	34	35	36
9	1001	9	25	26	27	28	29	30	31	32	33	34	35	36	37	38
A	1010	LF	10	26	27	28	29	30	31	32	33	34	35	36	37	38
B	1011	ESC	11	27	28	29	30	31	32	33	34	35	36	37	38	39
C	1100	FF	12	28	29	30	31	32	33	34	35	36	37	38	39	40
D	1101	CR	13	29	30	31	32	33	34	35	36	37	38	39	40	41
E	1110	SO	14	30	31	32	33	34	35	36	37	38	39	40	41	42
F	1111	SI	15	31	32	33	34	35	36	37	38	39	40	41	42	43

Appendix I CHARACTER VECTOR DIAGRAMS





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**FEDERAL COMMUNICATIONS COMMISSION
RADIO FREQUENCY INTERFERENCE
STATEMENT**

"This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient the receiving antenna
- relocate the computer with respect to the receiver
- move the computer away from the receiver
- plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions.

The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems."

This booklet is available from the US Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4."

This statement will be applied only for the printers marketed in the U.S.A.

WARNING

The connection of a non-shielded printer interface cable to this printer will invalidate the FCC Certification of this device and may cause interference levels which exceed the limits established by the FCC for this equipment.

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